

REMARKS

Summary of the Office Action

Claims 4 and 10 stand objected to because of alleged informalities.

Claims 14 and 15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hertz (U.S. Patent No. 4,346,387) (hereinafter "Hertz").

Claim 16 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Pui et al. (U.S. Patent No. 6,764,720) (hereinafter "Pui").

Claims 1-4, 6, 7, 10 and 11 stand rejected under 103(a) as being unpatentable by Hertz in view of Yogi et al. (U.S. Patent No. 6,811,090) (hereinafter "Yogi").

Claims 5, 8, 9, 12 and 13, while objected to as being dependent upon a rejected base claim, would be allowable if rewritten in independent form.

Summary of the Response to the Office Action

Applicants have amended claims 4, 5, 8-10 and 12-16, and added new claim 17, to differently describe the embodiments of the disclosure of the instant application's specification, to incorporate allowable subject matter indicated by the Examiner, and/or to improve the form of the claims. Accordingly, claims 1-17 are currently pending for consideration.

Claim Objections

Claims 4 and 10 stand objected to because of alleged informalities. Claims 4 and 10 have been amended to incorporate the helpful suggested amendments provided by the Examiner at page 2 of the Office Action. Accordingly, withdrawal of the objections to claim 4 and 10 is respectfully requested.

Rejections under 35 U.S.C. §§ 102(a) and 103(a)

Claims 14 and 15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hertz. Claim 16 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Pui. Claims 1-4, 6, 7, 10 and 11 stand rejected under 103(a) as being unpatentable by Hertz in view of Yogi. Applicants have amended claims 4, 5, 8-10 and 12-16 to differently describe the embodiments of the disclosure of the instant application's specification, to incorporate allowable subject matter indicated by the Examiner, and/or to improve the form of the claims. The rejections are respectfully traversed for at least the following reasons.

With regard to the rejections of claims 1-4, 6, 7, 10 and 11, Applicants respectfully submit that these claims describe particular features including a mixed liquid droplet forming method/apparatus, a voltage is applied between one nozzle (ink) and a flat electrode to form a droplet, and a voltage is applied between the other nozzle (dilution) and a flat electrode to mix the droplet and the liquid in the other nozzle.

The Examiner states that Hertz discloses: a mixed droplet (3) on a receptor surface (11); a plurality of nozzles (2, 48); a flat electrode (6); and an electrode (27) provided on the outer

circumference of the nozzle (2). Applicants respectfully traverse these rejections for at least the following reasons.

Applicants respectfully submit that, according to Hertz, the liquids are mixed at the tip of the nozzle. That is, the apparatus of Hertz has a same problem as the arrangements described in the prior art portions of the specification of the instant application. On the other hand, Applicants respectfully submit that, according to their disclosed invention, as described in the combinations of independent claims 1, 3, 6 and 10, for example, the liquids are not mixed at the tip of the nozzle.

According to Hertz, nozzle (2) and nozzle (48) are not separated (Fig. 9). The nozzle (2) is arranged within the nozzle (48). As a result, Applicants respectfully submit that the liquids are mixed at the tip of the nozzle (2). On the other hand, according to Applicants' disclosed arrangements, as described in at least independent claims 1, 3, 6 and 10, the ink and dilution are independently housed in the nozzles.

According to Hertz, electrode (6) is arranged in the pathway of fluid jet (42). As a result, Applicants respectfully submit that the electrode (6) in Hertz is not flat as described in disclosed arrangements of the instant application, and as described in at least independent claims 1, 3, 6 and 10. Applicants respectfully submit that the disclosed flat electrode (3) in the instant application, as illustrated in Fig. 1, for example, of the instant application, is arranged at the end of pathway of the droplet.

Regarding claim 2 of the instant application Applicants respectfully submit that the outer electrode (20) (Fig. 6) is not disclosed in Hertz. The function of the outer electrode (20) is described in paragraph [0080] in the instant application's specification. On the other hand, Hertz

discloses an electrode (27) attached to a crystal (10) in Fig. 9. That is, Applicants respectfully submit that the electrode (27) is not provided at the outer circumference of the nozzle.

For at least the foregoing reasons, Applicants respectfully submit that Hertz is clearly different from the advantageous combinations of features described in each of claims 1-4, 6-7 and 10-11 of the instant application. Yogi fails to cure the deficiencies of Hertz. As a result, Applicants respectfully submit that even if Hertz and Yogi were combined as asserted by the Office Action, a person having ordinary skill in the subject art could not easily derive these inventions from such a combination of references at least because all of the claimed features are not taught or suggested by either of the references.

With regard to claims 14 to 17, the Examiner states that Hertz shows a flat electrode (6). However, Applicants respectfully submit that the electrode (6) of Hertz is not flat. Even further, Applicants respectfully submit that the function of the flat electrode (3) discussed in the instant application is not disclosed in Hertz. As a result, Applicants respectfully submit that a person having ordinary skill in the subject art could not derive such a structure from the disclosure of Hertz.

Claim 16 further defines the outer electrode (20) discussed previously. Applicants refer, for example, to Fig. 6 and paragraphs [0077] to [0082] in the instant application's specification in this regard. According to paragraph [0080] of the instant application's specification "the electrostatic inductive charge 21 appearing at the front end of the electrode 20 biases the charge distribution of the electrostatic inductive charge 161 on the surface of the dilute solution so that the distribution becomes highest at the center of the nozzle, so that a great electrostatic force acts on the portion with the high charge density, that is, between the center of the dilute solution

surface and the flat electrode 3. As a result, the Taylor Cone 16 stays within the inner diameter portion of the nozzle end face, and the form thereof is deformed to be more acute. This is a result of concentration of the electrical line of force on the nozzle center portion. Therefore, the position where the droplet L is formed can be extremely stabilized. In other words, the droplet L can be accurately formed at a desired position on the recording sheet 4.”

In order to obtain this effect, Applicants respectfully submit that the nozzle should be made of insulating material. In an embodiment disclosed by Applicants, the nozzle is made of glass. Newly-added claim 17 defines such a feature.

Pui discloses an electrode (56) in Fig. 2 as pointed out by the Examiner. However, Applicants respectfully submit that the capillary tube (59) is made of conductive material (col. 11, lines 47-49). Therefore, Applicants respectfully submit that Pui cannot form a stable droplet by applying voltage between the liquid and a flat electrode (71).

Accordingly, Applicants respectfully assert that the rejections under 35 U.S.C. §§ 102(b) and 103(a) should be withdrawn because neither of Hertz nor Yogi, teach or suggest each feature of independent claims 1, 3, 6, or 10. Also, Hertz does not teach or suggest each feature of claims 14 and 15. Also, Pui does not teach or suggest each feature of claim 16. As pointed out in MPEP § 2131, “[t]o anticipate a claim, the reference must teach every element of the claim.” Thus, “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Verdegaal Bros. v. Union Oil Co. Of California, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987).” Similarly, MPEP § 2143.03 instructs that “[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 409 F.2d 981, 180 USPQ

580 (CCPA 1974).” Furthermore, Applicant respectfully asserts that the dependent claims are allowable at least because of their dependence from their respective independent claims, and the reasons set forth above.

Moreover, the Examiner is thanked for the indication that claims 5, 8, 9, 12 and 13, while objected to as being dependent upon a rejected base claim, would be allowable if rewritten in independent form. In accordance with the Examiner’s indication of allowable subject matter, each of these claims have been amended to be rewritten in independent form. Accordingly, withdrawal of the objections to these claims is respectfully requested. These claims are now in prima-facie condition for allowance.

CONCLUSION

In view of the foregoing, Applicants submit that the pending claims are in condition for allowance, and respectfully request reconsideration and timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants’ undersigned representative to expedite prosecution. A favorable action is awaited.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. § 1.16 and 1.17 which may be required, including

any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0573.

This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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